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(54) Golf club head

(57) A head for a golf club has a hosel 3 by which the club head 4 is attached to a golf club. A ball striking blade 5 is arranged to extend from the hosel and supports on its side remote from a striking face, a loading weight 6 having a conical formation. Preferably, a moment of force on the head delivered by the conical weighting means in use is directed to a sweet spot on the striking face of the blade. The ball striking blade may be of a rounded configuration to define a round striking face. Conveniently, the rounded blade has a generally circular or ellipsoidal front striking face. Preferably, the weighting means is of a frusto-conical formation.

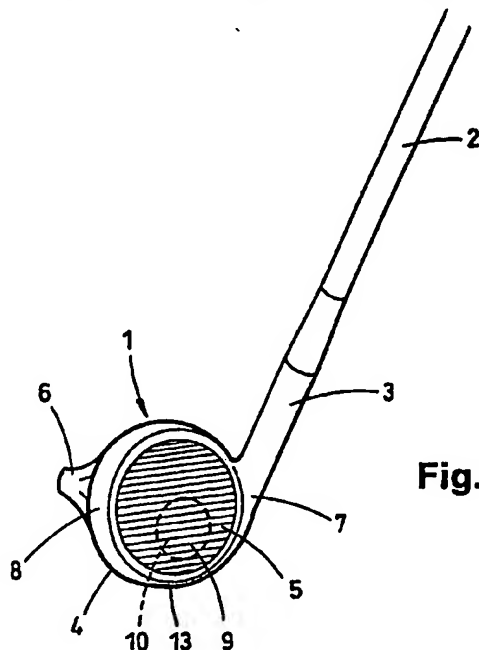


Fig. 1

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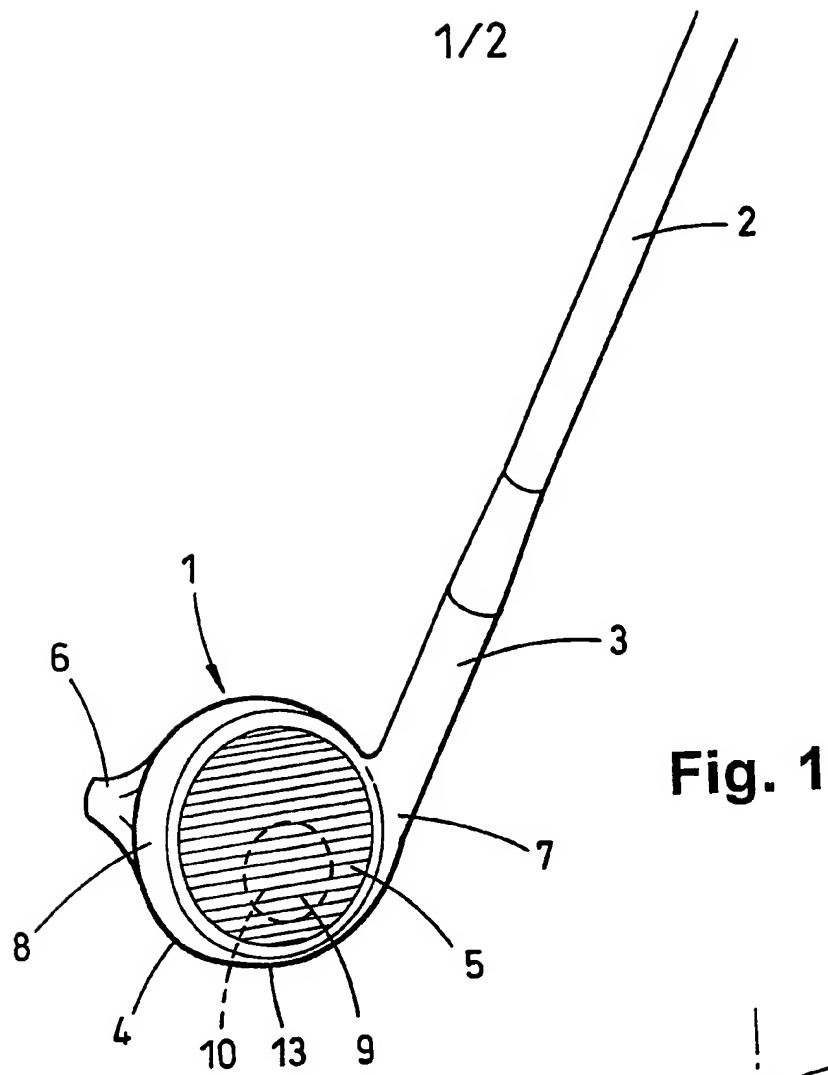
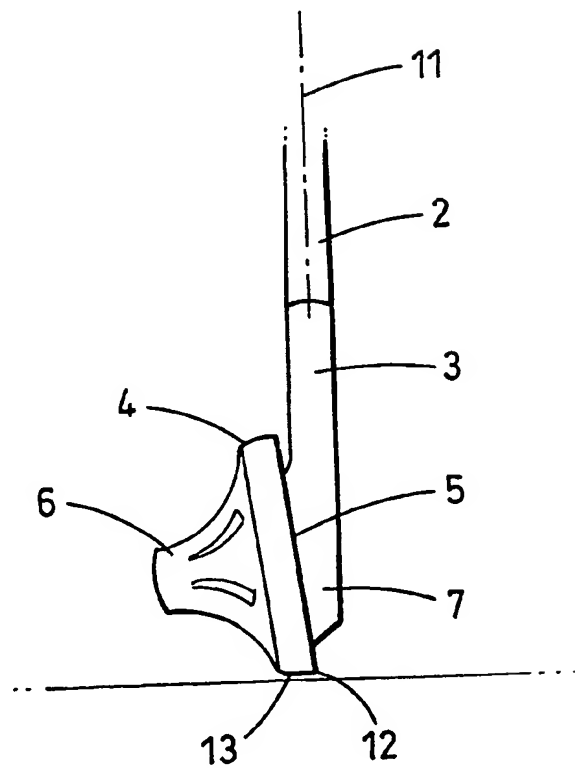
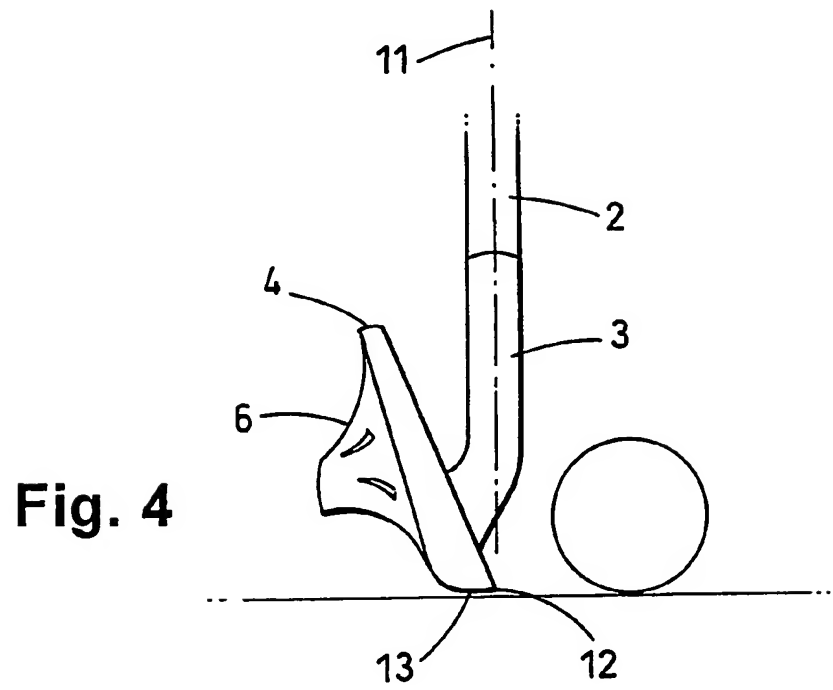
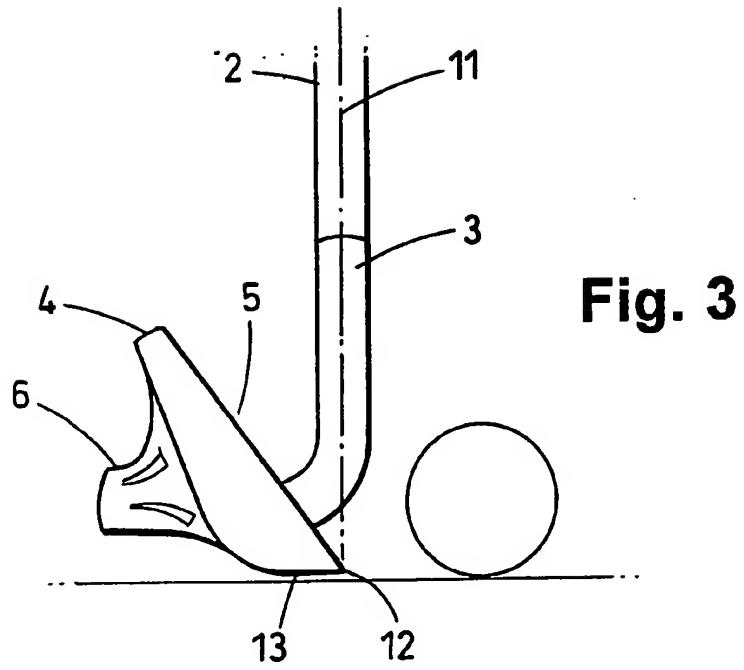


Fig. 1

Fig. 2



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A HEAD FOR A GOLF CLUB

This invention relates to head for a golf club.

Many forms of golf club heads are known and they differ according to individual manufacturing specifications depending upon the particular manufacturer of the heads. However, whilst all the heads have a hosel by which the head is attached to the shaft of a club, the blade of the head for the iron clubs is generally of an elongate rectangular form having a front striking face with upper trailing and lower leading edges a heel in the region of the hosel and a toe at the opposite end of the blade. The lower edge of the blade is generally straight and the defines the leading edge of a curved sole portion extending behind the striking face. The striking face has a series of grooves on it which gives some control over the flight of a ball struck by the head. The heads are usually made of forged or cast steel, or they may be made of stainless steel with a glass/alloy composite insert to define the grooved front face.

The heads are usually weighted in the form of a thick elongate portion at the back of the head which extends along the length of the blade at the bottom, towards the top, or across the middle of the head at the back thereof with the differing positions affecting the angle of flight of the ball.

A set of golf clubs would also include the

"woods" which have a similarly shaped striking face with a solid curved block of material extending behind it which provides the weight for the head.

The particular disadvantages of the club heads currently in use are that they are generally weighted along the bottom at the back thereof so that the moment of force of the head as it strikes a ball during swinging of the club is very low down in the region of the leading edge of the striking face and extends substantially all the way along the length of the blade. The length of the blade has the disadvantage that in striking the ball towards the toe of the blade, that is the side of the blade remote from the hosel, or heel of the blade at the bottom of the hosel, can cause the shaft to twist slightly in the hands of the golfer using the club resulting in a mishitting of the ball.

These disadvantages have to some extent been overcome by adjusting the location of the weighting of the head on the side thereof remote from the striking face, placing the weight centrally or towards the top of the blade. However, the momentum of force caused thereby always extends over the whole length of the blade.

It is an object of the present invention to provide a head for a golf club in which the above mentioned disadvantages are substantially eliminated.

According to one aspect of the present invention there is provided a head for a golf club comprising a hosel for attaching the head to a shaft of the golf club, a ball striking blade extending from the hosel, and weighting means on the back of the blade remote from a striking face of the said blade, the

weighting means being of a substantially conical formation.

Conical formation in the specification refers to a rounded elongate member having an enlarged base and a narrower pointed or flat top with the surface therebetween being of a continuously reducing diametrical length which may be irregularly located relative to a central axis of the formation to provide a smooth surface in the axial direction thereof.

In one preferred embodiment of the present invention a moment of force of the head delivered by the conical weighting means in use is directed through a sweet spot on the striking face of the blade. Preferably, the weighting means is of a frusto-conical formation.

In an alternative embodiment of the present invention the ball striking blade is of a rounded configuration to define a round striking face. Conveniently, the rounded blade has a generally circular or ellipsoidal front striking face.

According to another aspect of the present invention there is provided a set of golf clubs in which each of the woods and irons comprises a head and a shaft, the head comprising a hosel for attaching the head to the shaft of a golf club, a ball striking blade extending from the hosel, and weighting means on the back of the blade remote from the striking face, the weighting means being of a substantially conical formation.

Embodiments of the present invention will now

be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a head of a golf club in accordance with the present invention;

Fig. 2 is a side elevational view of an alternative head in accordance with the present invention.

Fig. 3 is a side elevational view of a further head in accordance with the present invention, and

Fig. 4 is a side elevational view similar to Figs. 2 and 3 of a further alternative head in accordance with the present invention.

Referring specifically to the drawings in which like parts bear the same reference numerals Fig. 1 illustrates a head 1 for a golf club which is attached to a shaft 2 via an elongate hosel 3 to which is attached at the end thereof remote from the attachment to the shaft a blade 4 having a front flat ball striking face 5 and a weight formation 6 projecting outwardly from the back surface of the blade opposite to the striking face 5.

The striking face 5 of the blade 4 is of a rounded or substantially oval configuration having a join 7 at the junction to the hosel 3. An outer flat peripheral surface 8 extends rearwardly from the striking face to a rear surface opposed to the striking face.

The flat striking face 5 is provided with a

plurality of parallel grooves 9 illustrated in the drawing as straight lines with each extending a different length but which together define an outer circular peripheral extremity with grooves of which a sweet spot region 10 is shown in dotted lines. The sweet spot is the region of the striking face 5 in which the moment of force imparted by the weight 6 in use passes through the head and through the centre of the sweet spot so that when the ball is hit correctly on this sweet spot the ball travels the maximum distance for the particular club in use. The grooves 9 are themselves a maximum of 0.035" (0.9mm) in width and 0.020" (0.5mm) in depth to comply with the teaching of the governing authority of golf, The Royal and Ancient Golf Club of St. Andrews. The distance between adjacent edges of the grooves are not less than three times the width of a groove, and not less than 0.075" (1.9mm).

The club head is of a constant thickness as shown in Fig. 2 to define a back surface opposite the striking face 5, from which back surface extends a substantially, frusto-conical weight 6. The head shown in Fig. 2 which illustrates a head for a number 1 or a number 2 iron for which the angle of the striking face relative to datum line 11 which runs centrally through the shaft 2 and the hosel 3. As will be seen in Figs. 2 to 4, leading edge 12 of the striking face 5 is in line with the datum line 11 irrespective of the angle at which the striking face lies relative to the datum line.

A sole 13 extends rearwardly from the leading edge 12 perpendicularly to the datum line 11, to meet the back surface from which weight 6 protrudes. The sole 13 has a flat surface so that it forms a sharp edge with the leading edge 12. With the shaft of a club held

vertically the sole extends parallel to the ground over the depth 8 of the club when there is an immediate continuous increase in gap between the head and ground until the weight 6 is met by the sole surface. This flat sole surface or sharp leading edge avoids flattening of grass beneath the head as a golf club swings through the air and is about to hit the ball thereby enabling a lower and therefore cleaner contact with the ball. Therefore, the flat base or sole will assist at all times to ensure the striking face of the club head contacts the ball lower down relative to the height of the ball particularly when playing from the rough or longer grass areas.

The frusto-conical weight 6 is located on the back surface of the blade 4 as shown clearly in Fig. 2 so that the moment of force of the weight extends through the sweet spot region of the striking face 5. The surface of the weight 6 is concave in longitudinal cross-section.

Referring to Fig. 3 which is similar to Fig. 2 the striking face 5 is at a much steeper pitch angle relative to the datum line 11 and the blade 4 is shown to have wedge like configuration in thickness with the shorter edge at the top of the blade and the thicker edge at the bottom of the blade in the region of the sole 13. The frusto-conical weight 6 used here is of a concave frusto-conical shape with the rounded surface having a reducing diametrical length from the back surface of the blade to the frusto-conical surface. The particular shape of the generally frusto-conical weight 6 differs from the regular frusto-conical shape in the lower regions adjacent to the back face of the blade 4, resulting in a longitudinal axis (not shown)

of the frusto-conical weight being offset from being perpendicular to the back surface as in Fig. 2. The sole 13 is perpendicular to the datum line 11.

Fig. 4 is representative of a further club head similar to that in Figs. 2 and 3 in which the striking face 5 is at a steeper angle relative to the datum line 11 than the head shown in Fig. 2 but less than the head shown in Fig. 3. The thickness of the blade in Fig. 4 is again of a wedge shaped configuration similar to that of Fig. 3 but generally of a thinner construction. The sole 13 has a flat planar surface which extends to the back surface of the blade 4 and perpendicular to the datum line 11. Moreover, the frusto-conical weight is shaped to ensure that with the particular angle of striking face the force implanted by the weight as the club head swings forward is directed through the sweet spot of the striking face. The leading edge of the striking face is in line with the datum line in Fig. 4.

The provision of a frusto-conical weight 6 attached to the rear surface of the blade 4 provides a much greater force upon striking the ball than would otherwise be available because the whole weight is directed through the sweet spot of the club head, whereas on known club heads the weight is distributed along the whole length of the blade and therefore at the point at which the blade contacts the ball the force imparted by the weight is much less than the force imparted by the weight 6 of the present invention.

Accordingly, because of this increased force no "woods" would be needed and it is envisaged that a tournament set of fourteen clubs would comprise thirteen

clubs each having a head with a different angle of striking face 5 relative to the datum line 11. The fourteenth club is a putter of any standard configuration but which can include a frusto-conical weight protruding from the rear surface thereof in accordance with the present invention.

Although three examples of club heads of such a set are illustrated in Figs. 2 to 4 the angle of the striking face relative to the datum line 11 can vary between 8° and 60° . The club lengths can vary from 44 inches (11.76cm) for a one iron to 35 inches (88.9cm) for a thirteen iron. The putter is of a standard form. Therefore, there are a number of irons at both ends of the pitch scale for selection to suit individual tastes.

In an alternative form of the invention a bore may be provided through the frusto-conical weight to extend to the sweet spot region of the striking face. The bore is filled with a force responsive material such as epoxy resin or a glass alloy composite.

Accordingly, there has been described a head for a golf club which is both rounded thereby eliminating the heel and toe areas of the club head and providing a flat sole which prevents flattening of the grass and ground which would otherwise result in wedges of grass which may cause the club head to hit the ball further up the height of the ball than is desired. The flat planar sole surface substantially prevents such flattening to occur thereby improving play from the rough and allowing the taking of cleaner divots from the fairway to increase backspin. Moreover, the weight attached to the back surface of the blade is concentrated through the sweet spot region of the club

head or striking face to produce a much greater moment of force when the club head swinging through the air strikes the ball.

The elongate roundness, possibly almost to the point of being circular, of the head eliminates the toe and heel portions and is less likely to cause the club to turn in a golfer's hands when hitting the ball. Moreover, the roundness can be extended slightly to an ellipsoidal shape head with curved edge surfaces. However, the length of the blade must be greater than its breadth along a line space 0.625 (1.59cm) from and parallel with the sole to meet the formal ruling of The Royal and Ancient Golf Club of St. Andrews.

The hosel 3 conforms with the formal length requirement of being not more than 5" (127mm) in length measured from the top of the hosel to the sole 13 along its axis (datum line 11).

Whilst the head of the clubs may be made of forged or cast stainless steel it is possible for the heads to have blades of a laminated construction in which the grooved striking area is an insert of glass alloy composite located in a recess in the stainless steel head and having grooves on its outermost surface to comply with the rules of The Royal and Ancient Club of St. Andrews.

Moreover, the concave frusto-conical surface of weight 6 may be replaced by a linear or straight frusto-conical surface in longitudinal cross-section.

CLAIMS:

1. A head for a golf club comprising a hosel for attaching the head to the shaft of a golf club, a ball striking blade extending from the hosel, and weighting means on the back of the blade remote from the striking face, the weighting means being of a substantially conical formation.
2. A head as claimed in claim 1, wherein a moment of force of the head delivered by the conical weighting means in use is directed through a sweet spot on the striking face of the blade.
3. A head as claimed in claim 1 or 2, wherein the ball striking blade is of a rounded configuration to define a round striking face.
4. A head as claimed in claim 3, wherein the rounded blade has a generally circular striking face.
5. A head as claimed in any one of claims 1 to 3, wherein the rounded blade has a generally ellipsoidal striking face.
6. A head as claimed in any one of the preceding claims, wherein the weighting means is of a frusto-conical formation.
7. A head as claimed in any one of the preceding claims, wherein the conical weighting means comprises a rounded elongate member having an enlarged base and a narrower pointed or flat top with the surface therebetween of a continuously reducing diametrical length which may be irregularly located relative to a

central axis of the conical formation to provide a smooth surface in the axial direction thereof.

8. A head as claimed in any one of the preceding claims, wherein the sole of the blade has a flat planar surface.

9. A head as claimed in any one of the preceding claims, including a hole extending through the weighting means and striking face at the sweet spot of the striking face, the hole being filled with a force responsive material.

10. A head as claimed in any of the preceding claims, wherein the head is made of forged or cast stainless steel.

11. A head as claimed in any one of the preceding claims, wherein the blade is of a laminated construction having a grooved striking area comprising an insert of glass alloy composite located in a recess in the stainless steel head.

12. A head as claimed in any of the preceding claims, wherein the weighting means has a concave frusto-conical surface.

13. A head as claimed in any of the claims 1 to 11, wherein the conical formation of the weighting means has a linear outer surface which is a straight line in longitudinal cross-section.

14. A set of golf clubs in which each of the woods and irons comprises a head and a shaft, the head comprising a hosel for attaching the head to the shaft of a golf

club, a ball striking blade extending from the hosel, and weighting means on the back of the blade remote from the striking face, the weighting means being of a substantially conical formation, each head having a different angle of striking face relative to a datum line extending longitudinally lengthwise of each club.

15. A set as claimed in claim 14, wherein the datum line extends centrally along the length of the club shaft and through the hosel.

16. A set as claimed in claims 14 or 15, wherein each club has an angle of striking face relative to the datum line which falls within the range 8° to 60° .

17. A set as claimed in claims 14, 15 or 16, in which the club lengths vary from 44 inches (111.76cm) for a one iron to 35 inches (88.9cm) for a thirteen iron.

18. A set as claimed in any one of claims 14 to 17, wherein the head of each club is made of stainless steel.

19. A set as claimed in any one of claims 14 to 18, wherein the blade of the head is of a laminated construction having a grooved striking area comprising an insert of a glass alloy composite in a stainless steel head.

20. A head for a golf club substantially as hereinbefore described with reference to, and as illustrated in Fig. 1; or Fig. 2; or Fig. 3; or Fig. 4 of the accompanying drawings.

21. A set of clubs in which each club includes a head

for a golf club substantially as hereinbefore described with reference to, and as illustrated in Fig. 1; or Fig. 2; or Fig. 3; or Fig. 4 of the accompanying drawings.

Relevant Technical Fields

- (i) UK Cl (Ed.N) A6D (D23B)
 (ii) Int Cl (Ed.6) A63B 53/04

Search Examiner
 D W WHITFIELD

Date of completion of Search
 14 FEBRUARY 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii)

Documents considered relevant
 following a search in respect of
 Claims :-
 1-21

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- Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category. **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
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Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 1297239	(ACUSHNET) whole document	1, 2, 6-9 13-15
X	GB 0473088	(HAMILTON) whole document	1, 2, 6, 7 13-15
X	GB 0452305	(GLOVER) whole document	1, 2, 6, 7 14, 15
Y	US 4792140	(SUMITOMO) whole document	10, 11
X:Y	US 4195842	(COLEMAN) whole document	X:1-4, 6 Y:10, 11
X	US 2447967	(STONE) whole document	1, 2, 5-8 14, 15, 17

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